

In the Claims:

The current claim set of the application is presented below. Indications as to the status of the claims ("original", "currently amended", "canceled", "new", etc.) appear in parentheses after the claim number. Deletions are identified in bold with double brackets and strikethrough (e.g. **[[deletion]]**) and new text is identified in bold with underlining (e.g. **new language**).

1. (Currently Amended) An implantable brain stimulation lead comprising:
a **substantially cylindrical** lead body having a proximal end, a distal end, and **[[an]] a**
substantially ring-like electrode **approximately defining an arc or circumference**; and
an electrically insulating member that extends over the lead body and **covers a first**
portion of the arc or circumference of the electrode, the insulating member defining
[defines] a window that exposes a **second** portion of **the arc or circumference of** the electrode
to increase directionality of stimulation current delivered by the electrode.
2. (Currently Amended) The lead of claim 1, wherein the electrode **[[is**
substantially ring-like and]] extends approximately 360 degrees about the lead body.
3. (Currently Amended) **[[The lead of claim 2]]** **An implantable brain**
stimulation lead comprising:
a lead body having a proximal end, a distal end, and an electrode, wherein the
electrode is substantially ring-like and extends approximately 360 degrees about the lead
body; and
an electrically insulating member that extends over the lead body and defines a
window that exposes a portion of the electrode to increase directionality of stimulation
current delivered by the electrode, wherein the portion of the electrode exposed by the window
extends between approximately 110 and 130 degrees about the lead body.
4. (Currently Amended) The lead of claim **[[2]] 3**, wherein the portion of the
electrode exposed by the window extends approximately 120 degrees about the lead body.

5. (Original) The lead of claim 1, wherein the lead body has a plurality of electrodes, and the insulating member defines a plurality of windows, each of the windows exposing a portion of one of the electrodes.

6. (Original) The lead of claim 5, wherein the lead body includes four electrodes, and the insulating member defines four windows.

7. (Original) The lead of claim 5, wherein at least some of the windows are defined at different axial positions along the lead body.

8. (Currently Amended) The lead of claim 5, wherein ~~[[the lead body is substantially cylindrical, and]]~~ at least some of the windows are defined at different circumferential positions about the lead body.

9. (Currently Amended) ~~[[The lead of claim 1,]]~~ **An implantable brain stimulation lead comprising:**
a lead body having a proximal end, a distal end, and an electrode; and
an electrically insulating member that extends over the lead body and defines a window that exposes a portion of the electrode to increase directionality of stimulation current delivered by the electrode;

wherein the lead body has a plurality of electrodes, and the window is pitched to extend in a spiral pattern along the length and about the circumference of the insulating member and thereby expose portions of each of the electrodes.

10. (Original) The lead of claim 1, wherein the insulating member is formed as a sleeve-like member that extends over a portion of the lead body.

11. (Original) The lead of claim 10, wherein the sleeve-like member is molded to define the window.

12. (Original) The lead of claim 10, wherein the sleeve-like member is cut to define the window.

13. (Original) The lead of claim 1, wherein the insulating member is coated onto the lead body to define the window.

14. (Original) The lead of claim 1, wherein the window has a shape selected from the group consisting of a rectangle, square, oval and circle.

15. (Currently Amended) ~~[[The lead of claim 1,]]~~ An implantable brain stimulation lead comprising:
a lead body having a proximal end, a distal end, and an electrode; and
an electrically insulating member that extends over the lead body and defines a window that exposes a portion of the electrode to increase directionality of stimulation current delivered by the electrode;

wherein the lead body has a diameter of approximately 1.1 to 1.5 mm and the electrode has a length extending longitudinally relative to the lead body of approximately 1.3 to 1.7 mm.

16. (Currently Amended) The lead of claim ~~[[4]]~~ 15, wherein the lead body has a diameter of approximately 1.3 mm and the electrode has a length extending longitudinally relative to the lead body of approximately 1.5 mm.

17. (Currently Amended) An implantable brain stimulation lead comprising:
a lead body having a proximal end, a distal end, and ~~[[an]]~~ a substantially ring-like
electrode approximately defining an arc or circumference; and
means for insulating at least a portion of the lead body, including at least a first portion of the arc or circumference of the electrode, and exposing a second portion of the arc or circumference of the electrode to increase directionality of stimulation current delivered by the electrode.

18. (Currently Amended) ~~[[The lead of claim 17,]]~~ An implantable brain stimulation lead comprising:
a lead body having a proximal end, a distal end, and an electrode; and
means for insulating at least a portion of the lead body and exposing a portion of the electrode to increase directionality of stimulation current delivered by the electrode;

wherein the electrode is substantially ring-like and extends approximately 360 degrees about the lead body, and the portion of the electrode exposed by the insulating means extends for approximately 110 to 130 degrees about the lead body.

19. (Original) The lead of claim 18, wherein the portion of the electrode exposed by the window extends approximately 120 degrees about the lead body.

20. (Currently Amended) The lead of claim 17, wherein the lead body has a plurality of electrodes, and the insulating means insulates a first portion of each of the electrodes and exposes a second portion of each of the electrodes.

21. (Currently Amended) The lead of claim 20, wherein the insulating means exposes first portions of the electrodes at different axial positions along the lead body.

22. (Currently Amended) The lead of claim 20, wherein ~~[[the lead body is substantially cylindrical, and]]~~ the insulating means exposes second portions of the electrodes at different circumferential positions about the lead body.

23. (Currently Amended) ~~[[The lead of claim 17,]]~~ An implantable brain stimulation lead comprising:
a lead body having a proximal end, a distal end, and an electrode; and
means for insulating at least a portion of the lead body and exposing a portion of the electrode to increase directionality of stimulation current delivered by the electrode;

wherein the lead body has a plurality of electrodes, and the insulating means defines a window that is pitched to extend in a spiral pattern along the length and about the circumference of the insulating member and thereby expose portions of each of the electrodes.

24. (Currently Amended) ~~[[The lead of claim 17,]]~~ **An implantable brain stimulation lead comprising:**
a lead body having a proximal end, a distal end, and an electrode; and
means for insulating at least a portion of the lead body and exposing a portion of the electrode to increase directionality of stimulation current delivered by the electrode;

wherein the lead body has a diameter of approximately 1.1 to 1.5 mm and the electrode has a length extending longitudinally relative to the lead body of approximately 1.3 to 1.7 mm.

25. (Currently Amended) The lead of claim ~~[[17]]~~ **24**, wherein the lead body has a diameter of approximately 1.3 mm and the electrode has a length extending longitudinally relative to the lead body of approximately 1.5 mm.

26. (Currently Amended) ~~[[A]]~~ **An** implantable lead kit for brain stimulation, the lead kit comprising:

a lead body having a proximal end, a distal end, and ~~[[an]]~~ **a substantially ring-like electrode approximately defining an arc or circumference;** and

an electrically insulating member defining a window; and

means for attaching the insulating member to the lead body such that the insulating member extends over the lead body **to cover a first portion of the arc or circumference of the electrode** and the window exposes a **second** portion of **the arc or circumference of the electrode** to thereby increase directionality of stimulating current delivered by the electrode.

27. (Currently Amended) The lead kit of claim 26, wherein the electrode ~~[[is substantially ring-like and]]~~ extends approximately 360 degrees about the lead body.

28. (Currently Amended) ~~[[The lead kit of claim 27,]]~~ **An implantable lead kit for brain stimulation, the lead kit comprising:**

a lead body having a proximal end, a distal end, and an electrode wherein the electrode is substantially ring-like and extends approximately 360 degrees about the lead body; and

an electrically insulating member defining a window wherein the portion of the electrode exposed by the window extends between approximately 110 and 130 degrees about the lead body; **and**

means for attaching the insulating member to the lead body such that the insulating member extends over the lead body and the window exposes a portion of the electrode to thereby increase directionality of stimulating current delivered by the electrode.

29. (Currently Amended) The lead kit of claim ~~[[27]]~~ **28**, wherein the portion of the electrode exposed by the window extends approximately 120 degrees about the lead body.

30. (Original) The lead kit of claim 26, wherein the lead body has a plurality of electrodes, and the insulating member defines a plurality of windows, each of the windows exposing a portion of one of the electrodes.

31. (Original) The lead kit of claim 30, wherein the lead body includes four electrodes, and the insulating member defines four windows.

32. (Original) The lead kit of claim 30, wherein at least some of the windows are defined at different axial positions along the lead body.

33. (Original) The lead kit of claim 30, wherein the lead body is substantially cylindrical, and at least some of the windows are defined at different circumferential positions about the lead body.

34. (Currently Amended) ~~[[The lead kit of claim 30,]]~~ An implantable lead kit for brain stimulation, the lead kit comprising:

a lead body having a proximal end, a distal end, and a plurality of electrodes; and
an electrically insulating member defining a window wherein ~~[[the lead body has a plurality of electrodes, and]]~~ the window is pitched to extend in a spiral pattern along the length and about the circumference of the insulating member and thereby ~~[[expose]]~~ exposes portions of each of the electrodes; and

means for attaching the insulating member to the lead body such that the insulating member extends over the lead body and the window exposes portions of each of the electrodes to thereby increase directionality of stimulating current delivered by the electrode.

35. (Currently Amended) ~~[[The lead kit of claim 30,]]~~ An implantable lead kit for brain stimulation, the lead kit comprising:

a lead body having a proximal end, a distal end, and a plurality of electrodes; and
a plurality of the insulating members, wherein the insulating members ~~[[include]]~~ define differently configured windows each configured to selectively expose a portion of ~~[[the electrode]]~~ at least one of the plurality of electrodes; and

means for attaching the insulating members to the lead body such that the insulating members extends over the lead body and the windows expose portions of the electrodes to thereby increase directionality of stimulating current delivered by the electrodes.

36. (Currently Amended) ~~[[The lead of claim 26,]]~~ A implantable lead kit for brain stimulation, the lead kit comprising:

a lead body having a proximal end, a distal end, and an electrode wherein the lead body has a diameter of approximately 1.1 to 1.5 mm and the electrode has a length extending longitudinally relative to the lead body of approximately 1.3 to 1.7 mm; and
an electrically insulating member defining a window; and

means for attaching the insulating member to the lead body such that the insulating member extends over the lead body and the window exposes a portion of the electrode to thereby increase directionality of stimulating current delivered by the electrode.

37. (Currently Amended) The lead of claim ~~[[26]]~~ **36**, wherein the lead body has a diameter of approximately 1.3 mm and the electrode has a length extending longitudinally relative to the lead body of approximately 1.5 mm.

38. (Currently Amended) A method for producing directional output from an implantable stimulation lead having a lead body and ~~[[an]]~~ **a substantially ring-like** electrode formed with the lead body, **the electrode approximately defining an arc or circumference**, the method comprising:

forming an insulating member over the lead body, wherein the insulating member defines a window; and

positioning the insulating member relative to the lead body so that the window exposes a selected portion of **the arc or circumference of** the electrode, **while insulating at least one other portion of the arc or circumference of the electrode**, to increase directionality of stimulating current delivered by the stimulation electrode.

39. (Currently Amended) ~~[[The method of claim 38,]]~~ **A method for producing directional output from an implantable stimulation lead having a lead body and an electrode formed with the lead body, the method comprising:**

forming an insulating member over the lead body, wherein the insulating member defines a window; and

positioning the insulating member relative to the lead body so that the window exposes a selected portion of the electrode to increase directionality of stimulating current delivered by the stimulation electrode;

wherein the electrode is substantially ring-like and extends approximately 360 degrees about the lead body, and the portion of the electrode exposed by the window extends for approximately 110 to 130 degrees about the lead body.

40. (Original) The method of claim 39, wherein the portion of the electrode exposed by the window extends approximately 120 degrees about the lead body.

41. (Original) The method of claim 38, wherein the lead body has a plurality of electrodes, and the insulating member defines a plurality of windows, the method further comprising positioning the insulating member so that each of the windows exposes a portion of one of the electrodes.

42. (Original) The method of claim 41, wherein the lead body includes four electrodes, and the insulating member defines four windows, the method further comprising positioning the insulating member so that each of the four windows exposes a portion of one of the four electrodes.

43. (Original) The method of claim 41, wherein at least some of the windows are defined at different axial positions along the lead body.

44. (Original) The method of claim 41, wherein the lead body is substantially cylindrical, and at least some of the windows are defined at different circumferential positions about the lead body.

45. (Currently Amended) ~~[[The method of claim 44,]]~~ **A method for producing directional output from an implantable stimulation lead having a substantially cylindrical lead body and an electrode formed with the lead body, the method comprising:**
forming an insulating member over the lead body, wherein the insulating member defines a window; and
positioning the insulating member relative to the lead body so that the window exposes a selected portion of the electrode to increase directionality of stimulating current delivered by the stimulation electrode;

wherein the lead body has a plurality of electrodes, and the window is pitched to extend in a spiral pattern along the length and about the circumference of the insulating member and thereby expose portions of each of the electrodes, the method further comprising positioning the insulating member so that selected portions of the electrodes are exposed at selected portions of the window. [:-]

46. (Currently Amended) The method of claim 38, wherein the insulating member is formed as a sleeve-like member that extends over a portion of the lead body, and positioning the insulating member includes sliding the insulating member relative to the lead body. [:-]

47. (Currently Amended) ~~[[The method of claim 46,]]~~ A method for producing directional output from an implantable stimulation lead having a lead body and an electrode formed with the lead body, the method comprising:

forming an insulating member over the lead body, wherein the sleeve-like member is molded to define [the] a window and the insulating member is formed as a sleeve-like member that extends over a portion of the lead body; and

positioning the insulating member relative to the lead body so that the window exposes a selected portion of the electrode to increase directionality of stimulating current delivered by the stimulation electrode, wherein positioning the insulating member includes sliding the insulating member relative to the lead body.

48. (Currently Amended) ~~[[The method of claim 46,]]~~ A method for producing directional output from an implantable stimulation lead having a lead body and an electrode formed with the lead body, the method comprising:

forming an insulating member over the lead body, wherein the sleeve-like member is cut to define [the] a window and the insulating member is formed as a sleeve-like member that extends over a portion of the lead body; and

positioning the insulating member relative to the lead body so that the window exposes a selected portion of the electrode to increase directionality of stimulating current

delivered by the stimulation electrode, wherein positioning the insulating member includes sliding the insulating member relative to the lead body.

49. (Currently Amended) ~~[[The method of claim 38,]]~~ A method for producing directional output from an implantable stimulation lead having a lead body and an electrode formed with the lead body, the method comprising:

forming an insulating member over the lead body, wherein the insulating member defines a window; and

positioning the insulating member relative to the lead body so that the window exposes a selected portion of the electrode to increase directionality of stimulating current delivered by the stimulation electrode;

wherein the insulating member is coated onto the lead body to define the window, and positioning the insulating member includes controlling the coating of the insulating member to define the position of the window relative to the electrode.

50. (Original) The method of claim 38, wherein the window has a shape selected from the group consisting of a rectangle, square, oval and circle.

51. (Currently Amended) ~~[[The method of claim 38,]]~~ A method for producing directional output from an implantable stimulation lead having a lead body and an electrode formed with the lead body wherein the lead body has a diameter of approximately 1.1 to 1.5 mm and the electrode has a length extending longitudinally relative to the lead body of approximately 1.3 to 1.7 mm, the method comprising:

forming an insulating member over the lead body, wherein the insulating member defines a window; and

positioning the insulating member relative to the lead body so that the window exposes a selected portion of the electrode to increase directionality of stimulating current delivered by the stimulation electrode.

52. (Currently Amended) The method of claim ~~[[38]]~~ **51**, wherein the lead body has a diameter of approximately 1.3 mm and the electrode has a length extending longitudinally relative to the lead body of approximately 1.5 mm.

53. (Original) The method of claim 31, further comprising defining axial and radial positions of the lead body relative to a desired stimulation target.

54. (Currently Amended) An implantable brain stimulation lead comprising:
a lead body having a proximal end, a distal end, and ~~[[an]]~~ **a substantially ring-like electrode approximately defining an arc or circumference;**
an electrically insulating member that extends over the lead body, **thereby covering a first portion of the arc or circumference of the electrode,** and defines a window that exposes a **second** portion of the electrode to increase directionality of stimulation current delivered by the electrode; and
a mechanism that substantially fixes the insulating member in place relative to the lead body.

55. (Original) The lead of claim 54, wherein the mechanism includes an interlocking structure that joins the insulating member and the lead body.

56. (Original) The lead of claim 55, wherein the interlocking structure includes an aperture formed in the insulating member and a locking member carried by the lead body, the locking member being insertable into the aperture to substantially fix the insulating member in place relative to the lead body.

57. (Currently Amended) An implantable brain stimulation lead comprising:
a lead body having a proximal end and a distal end;
a distal electrode adjacent the distal end of the lead body, **the distal electrode being substantially ring-like and approximately defining an arc or circumference;**

an intermediate electrode disposed between the proximal and distal ends of the lead body, **the intermediate electrode being substantially ring-like and approximately defining an arc or circumference;**

a first electrically insulating member that extends over the lead body proximate the distal end, **thereby covering a first portion of the circumference of the distal electrode,** and defines a first window that exposes a **second** portion of the distal electrode to increase directionality of stimulation current delivered by the distal electrode; and

a second electrically insulating member that extends over the lead body between the proximal end and the distal end, **thereby covering a first portion of the circumference of the intermediate electrode,** and defines a second window that exposes a **second** portion of the intermediate electrode to increase directionality of stimulation current delivered by the intermediate electrode.

58. (Original) The lead of claim 57, wherein the intermediate electrode is positioned for access to a first brain target and the distal electrode is positioned for access to a brain second target.

59. (Original) The lead of claim 57, wherein the distal electrode includes a plurality of distal electrodes.

60. (Currently Amended) A brain stimulation system comprising:
a lead body having a proximal end and a distal end;

[[an]] a substantially ring-like electrode on the lead body, the electrode approximately defining an arc or circumference;

an electrically insulating member that extends over the lead body, **thereby covering a first portion of the arc or circumference of the electrode,** and defines a window that exposes a **second** portion of the electrode to increase directionality of stimulation current delivered by the electrode;

a conductor extending between the electrode and the proximal end of the lead body; and

a stimulation controller that delivers stimulation current to the electrode via the conductor.

61. (Original) The system of claim 60, wherein the electrode is substantially ring-like and extends approximately 360 degrees about the lead body.

62. (Currently Amended) ~~[[The system of claim 61,]]~~ A brain stimulation system comprising:

a lead body having a proximal end and a distal end;

an electrode on the lead body wherein the electrode is substantially ring-like and extends approximately 360 degrees about the lead body;

an electrically insulating member that extends over the lead body and defines a window that exposes a portion of the electrode to increase directionality of stimulation current delivered by the electrode wherein the portion of the electrode exposed by the window extends between approximately 110 and 130 degrees about the lead body;

a conductor extending between the electrode and the proximal end of the lead body;
and

a stimulation controller that delivers stimulation current to the electrode via the conductor.

63. (Original) The system of claim 62, wherein the portion of the electrode exposed by the window extends approximately 120 degrees about the lead body.

64. (Original) The system of claim 61, wherein the lead body has a plurality of electrodes, and the insulating member defines a plurality of windows, each of the windows exposing a portion of one of the electrodes.

65. (Original) The system of claim 64, wherein at least some of the windows are defined at different axial positions along the lead body.

66. (Original) The system of claim 64, wherein the lead body is substantially cylindrical, and at least some of the windows are defined at different circumferential positions about the lead body.

67. (Currently Amended) [[The system of claim 60,]] **A brain stimulation system comprising:**
a lead body having a proximal end and a distal end;
a plurality of electrodes on the lead body;
an electrically insulating member that extends over the lead body and defines a window that exposes a portion of the electrode to increase directionality of stimulation current delivered by the electrode wherein **[the lead body has a plurality of electrodes, and]** the window is pitched to extend in a spiral pattern along the length and about the circumference of the insulating member and thereby expose portions of each of the electrodes;
a conductor extending between the electrode and the proximal end of the lead body;
and
a stimulation controller that delivers stimulation current to the electrode via the conductor.

68. (Original) The system of claim 60, wherein the insulating member is molded to define the window.

69. (Original) The system of claim 60, wherein the insulating member is cut to define the window.

70. (Currently Amended) ~~[[The system of claim 60,]]~~ A brain stimulation system comprising:

a lead body having a proximal end and a distal end, wherein the lead body has a diameter of approximately 1.1 to 1.5 mm ~~[[and]]~~;

an electrode on the lead body, wherein the electrode has a length extending longitudinally relative to the lead body of approximately 1.3 to 1.7 mm;

an electrically insulating member that extends over the lead body and defines a window that exposes a portion of the electrode to increase directionality of stimulation current delivered by the electrode;

a conductor extending between the electrode and the proximal end of the lead body;
and

a stimulation controller that delivers stimulation current to the electrode via the conductor.

71. (Currently Amended) The system of claim ~~[[60]]~~ 70, wherein the lead body has a diameter of approximately 1.3 mm and the electrode has a length extending longitudinally relative to the lead body of approximately 1.5 mm.

72. (Currently Amended) An implantable brain stimulation lead comprising:
a lead body having a proximal end, a distal end, and ~~[[an]]~~ a substantially ring-like electrode approximately defining an arc or circumference; and
an electrically insulating member that extends over the lead body, thereby covering at least a first portion of the arc or circumference of the electrode, and defines a window that exposes a second portion of the electrode to increase directionality of electrical activity sensed by the electrode.

73. (New) An implantable brain stimulation lead comprising:
a substantially cylindrical lead body having a proximal end, a distal end, and a
substantially ring-like electrode having an arc or circumference extending
substantially around the lead body; and

an electrically insulating member extending over at least a portion of the lead body to cover at least a first portion of the circumference of the electrode, and defining a window that exposes a second portion of the circumference of the electrode, thereby increasing directionality of stimulation current delivered by the electrode.

74. (New) The implantable brain stimulation lead of claim 73 wherein the second portion of the arc or circumference of the electrode extends between approximately 110 and 130 degrees about the lead body.

75. (New) The implantable brain stimulation lead of claim 74, wherein the portion of the electrode exposed by the window extends approximately 120 degrees about the lead body.

76. (New) The implantable brain stimulation lead of claim 73, wherein:
the lead body has a plurality of substantially ring-like electrode each having an arc or circumference extending substantially around the lead body; and
the insulating member covers first portions of the arc or circumference of the electrodes and defines a plurality of windows exposing second portions of the arc or circumference of the electrodes.

77. (New) The lead of claim 76, wherein the lead body includes four electrodes, and the insulating member defines four windows.

78. (New) The lead of claim 76, wherein at least some of the windows are defined at different circumferential positions about the lead body.

79. (New). The lead of claim 73, wherein:
the lead body has a plurality of substantially ring-like electrodes each having an arc or circumference extending substantially around the lead body, with a first portion of the arc or circumference of each electrode being covered by the insulating member; and

the window is pitched to extend in a spiral pattern along the length and about the circumference of the insulating member and thereby expose a second portion of the circumference of each of the electrodes in a spiral pattern along the lead body.

80. (New) The lead of claim 73, wherein:
the lead body has a plurality of substantially ring-like electrodes each having an arc or circumference extending substantially around the lead body, with a first portion of the arc or circumference of each electrode being covered by the insulating member; and
the window exposes a portion of the arc or circumference of each of the electrodes.

81. (New) The lead of claim 73, wherein the insulating member is formed as a sleeve-like member that extends over a portion of the lead body.

82. (New) The lead of claim 81, wherein the sleeve-like member is molded to define the window.

83. (New) The lead of claim 81, wherein the sleeve-like member is cut to define the window.

84. (New) The lead of claim 73, wherein the insulating member is coated onto the lead body to define the window.

85. (New) The lead of claim 73, wherein the window has a shape selected from the group consisting of a rectangle, square, oval and circle.

86. (New) The lead of claim 85, wherein the window has a shape selected from the group consisting of a rectangle and a square.

87. (New) The lead of claim 85, wherein the window has a shape selected from the group consisting of an oval and a circle.

88. (New) The lead of claim 73, wherein the lead body has a diameter of approximately 1.1 to 1.5 mm and the electrode has a length, extending longitudinally relative to the lead body, of approximately 1.3 to 1.7 mm.